WATERSHED MANAGEMENT AREA: 19

RANCOCAS CREEK DRAINAGE

The watershed management area includes watersheds draining the lower - middle portions of the Delaware River. The principal rivers here are the Rancocas, Cooper, and Pennsauken. The area overlies Burlington and Camden Counties and includes the following watersheds:

Cooper River
Newton Creek
Pennsauken Creek
Mill Creek
Rancocas Creek
Pompeston Creek
Baldwin Run
Mc Donald's Branch

Summary of ambient physical/chemical monitoring stations and classifications:

Station	**Classification**
No. Branch Rancocas Creek at Pemberton	FW-2 Nontrout/PL
So. Branch Rancocas Creek at Vincentown	FW-2 Nontrout/PL
McDonalds Br. in Lebanon State Forest	PL
So. Branch Pennsauken Creek at Cherry Hill	FW-2 Nontrout
No. Branch Pennsauken Creek near Moorestown	FW-2 Nontrout
Cooper River at Haddonfield	FW-2 Nontrout

Note: The North Branch Rancocas Creek at Pemberton and the South Branch Rancocas Creek at Vincentown both lie at the border of the Pinelands Commission's Protection Area, and hence will be assessed as both FW-2 Nontrout waters and as Pinelands (PL) waters.

The following monitoring locations have been discontinued as of 1991:

Cooper River at Lindenwold (FW-2 Nontrout)
Cooper River at Lawnside (FW-2 Nontrout)
So. Branch Rancocas Creek at Hainesport (FW-2 Nontrout)
No. Branch Rancocas Creek at Browns Mills (FW-2 Nontrout)
No. Branch Rancocas Creek at Mt. Holly (FW-2 Nontrout)

OVERALL MANAGEMENT AREA ASSESSMENT

- Swimmable Support Status:

WATERWAY	LOCATION	STATUS
No. Br. Rancocas Ck	at Pemberton	Full Support
So. Br. Rancocas Ck	at Vincentown	Full Support
McDonalds Br.	Lebanon State Forest	Full Support
So. Br. Pennsauken Ck	at Cherry Hill	No Support
No. Br. Pennsauken Ck	near Moorestown	No Support
Cooper River	at Haddonfield	No Support

- Summary of Aquatic Life Support Status (Number of stations within each assessment category). Note: See the Biological Assessment Table located at the end of this section for details regarding macroinvertebrate assessments within the watershed management area.

No Impairment: 9 Mod. Impairment: 22 Severe Impairment: 8

MAPS here

COOPER RIVER

WATERSHED DESCRIPTION

The Cooper River is 16 miles long and its watershed encompasses an area of 40 square miles. The river flows through Camden County to the Delaware River at Camden. The significant tributaries include the North Branch Cooper River and Tindale Run. There is intense development along the mainstem and the areas adjacent to the North Branch. The population centers are Camden, Pennsauken, Cherry Hill, Haddonfield, and Haddon Township. Major impoundments include Cooper River Lake, Kirkwood Lake, Evans Pond, Linden Lake, Hopkins Lake, and Square Circle Lake.

Overall land use in this watershed is primarily urban/suburban. The streams in the watershed have been classified FW-2 Nontrout. As of 1996, there are no longer any NJPDES permitted dischargers in the Cooper River watershed. Current discharges are limited to combined sewer (CSOs) and stormwater outfalls.

WATER QUALITY ASSESSMENT

Physical/Chemical Water Quality

Locations: Cooper River at Haddonfield

Dissolved Oxygen: Acceptable.

Temperature: Acceptable.

Nutrients: High levels of total phosphorus are observed. Median total phosphorus is 0.23 mg/l and 100% of values exceeded the criterion of 0.05 mg/l applied to locations upstream of impoundments. Inorganic nitrogen (NO_2 + NO_3) is at acceptable levels; the median is 0.45 mg/l with no values exceeding 0.55 mg/l. Some samples are high with oxygen-demanding material; BOD levels were on occasion above 3.0 mg/l and the median was 2.1 mg/l.

Bacteria: Elevated. The geometric mean is 904 MPN/100 ml and 67% of samples exceeded the 400 MPN/100ml criterion.

Heavy Metals: All five lead samples collected during the period of review exceeded the chronic aquatic life criterion. In addition, arsenic was observed at 2 to 3 ug/l in all five samples which can cause concern for drinking water use.

Summary: This location is characterized by elevated total phosphorus, poor sanitary quality, and levels of arsenic and lead which could impair the water here for potable use and for aquatic life support, respectively. In spite of what is observed during this review period, water quality here has shown significant improvement over the prior review period (1986 through 1990).

Significant reductions in nitrogenous compounds and fecal coliform bacteria are observed. Reductions are also noted in levels of total phosphorus.

Biological Monitoring

All monitoring locations on the North and South Branches of the Cooper River, as well as Newton Creek, indicate severely impaired biota. See the Biological Assessment Table located at the end of this section for details regarding macroinvertebrate assessments within the watershed.

POINT SOURCE ASSESSMENT

The water quality problems of the Cooper River had been the result of excessive municipal and industrial wastewater discharges, combined with the effects of urban stormwater runoff, combined sewer overflows and the limited assimilative ability of the stream. The Camden County M.U.A. regional sewage system has eliminated all of the municipal discharges to the Cooper River. A total of thirty-nine individual sewage treatment plants that were discharging inadequately treated wastewater into the Cooper River, its tributaries, as well as neighboring watersheds, have now been taken off-line and the flow conveyed to the upgraded and expanded Camden Co. MUA facility located in Camden City. Fecal coliform levels have declined and overall surface water quality has improved as a result of this regionalization.

Enforcement action was taken by the Department on the following nonpermitted dischargers:

FACILITY	LOCATION	RECEIVING WATER	POLLUTANT	COMMENTS
Garden State Race Track	Cherry Hill	unnamed trib to Cooper River	contaminated stormwater	Stormwater runoff contaminated with horse manure and horse wash-down discharged to trib. An ACO requiring Best Management Practices and sampling was executed in June of 1991 but sampling results still show elevated fecal coliform and enterococci in the discharge.
National Realty Inc., Lions Head Plaza	Somerdale, Camden Co.	Cooper River	sewage discharge	Sewage discharged from malfunctioning pump station during 1994 and 1995. ACOs with penalties were issued in July 1994 and February 1995. A settlement agreement was executed in July 1995 requiring corrective measures.
Site Development, Inc.	Cherry Hill	Cooper River	sewage discharge	Malfunctioning pump station resulted in a discharge of sewage throughout 1994. An ACO was executed in February 1995 requiring upgrades to the pump station.
Audubon Borough	Camden Co.	Peter's Creek	leaking raw sewage	Damaged sewer mains and underdrain system leaking untreated sewage into storm drain. Repairs have been made, but a complete review of the system for additional problems is pending.

Enforcement action was taken by the Department continued:

JSL Trailer Park	Camden City, Camden Co.	Newton Creek	sewage	JSL had a discharge from a pipe connected to an onsite sewage disposal system. The discharge ended by establishing a connection to Camden City's collection system.

NONPOINT SOURCE ASSESSMENT

The 16 mile long Cooper River is reported to receive nonpoint source pollution from roadways and housing construction as well as from croplands, storm sewers, combined sewers, suburban surfaces, highway maintenance, various spills, mining, and landfills. These, combined with point sources, are cited as contributing to impaired water quality and occasional fish kills in the river.

DESIGNATED USE ASSESSMENT

The Cooper River at Haddonfield does not support the swimmable (primary contact) designated use. The "aquatic life" designated use is not supported in either the Cooper River or the Newton Creek watersheds based upon macroinvertebrate monitoring.

PENNSAUKEN CREEK

WATERSHED DESCRIPTION

The Pennsauken Creek drains 33 square miles of southwestern Burlington County and northern Camden County. This creek flows into the Delaware River near Palmyra, New Jersey. The North Branch of the Pennsauken is in Burlington County, while the South Branch is the boundary between Burlington and Camden Counties. The tide affects the three mile mainstem and the first few miles up the branches. Populations are centered in Mt. Laurel, Maple Shade, Cherry Hill and downstream of Maple Shade. Industry is concentrated at the mouth of the Pennsauken Creek. Much of this watershed is developed urban/suburban area, with the remainder divided between farmland and forested land. There are more than 10 NJPDES permitted dischargers here, of which two are industrial and the rest municipal. Waters have been classified FW-2 Nontrout.

WATER QUALITY ASSESSMENT

Physical/Chemical Water Quality

Locations: South Branch Pennsauken Creek at Cherry Hill

Dissolved Oxygen: No violations of the lower criterion for non-trout waters are observed; however, daytime dissolved oxygen levels are frequently low and suggest that night-time conditions may be unacceptable.

Temperature: Acceptable.

Nutrients: Highly enriched. Inorganic nitrogen is very high, with a median value of 2.8 mg/l. Total phosphorous is also very high, with all samples exceeding the 0.1 mg/l criterion. The median value is 0.34 mg/l.

Bacteria: Sanitary quality is very poor; the geometric mean is 3567 MPN/100 ml and 95% of samples exceeded 400 MPN/100 ml.

Heavy Metals: One of five arsenic samples was recorded at 2 ug/l, which suggests that additional sampling may be warranted to determine if arsenic should be of concern if the waters are used for drinking.

Sodium: One violation of the criterion was recorded; the median equaled 23.5 mg/l.

Other: Biochemical oxygen demand is high at this location where several samples exceeded 5.0 mg/l.

Locations: North Branch Pennsauken Creek at Moorestown

Dissolved Oxygen: Acceptable.

Temperature: One violation of the upper criterion for non-trout waters was observed, and in-stream temperatures tend to run warm at this location.

Nutrients: Inorganic nitrogen is acceptable; median value is 0.37 mg/l. Total phosphorous is, in contrast, elevated, with 85% of samples exceeding the 0.05 mg/l criterion applied to locations upstream of impoundments. The median value of total phosphorus is 0.15 mg/l.

Bacteria: Mildly elevated bacterial levels were recorded at Moorestown. The geometric mean was 222 MPN/100 ml and 35% of samples exceeded the 400 MPN/100ml criterion.

Heavy Metals: As observed in the South Branch, one of four arsenic samples was recorded at 2 ug/l, suggesting that additional sampling may be warranted to determine if arsenic should be of concern if the waters are used for drinking. One of the four lead records exceeded the chronic criterion for aquatic life support.

Sodium: Two violations of the criterion were recorded; the median is 15 mg/l.

Other: Biochemical oxygen demand is relatively high; several samples exceeded 4.0 mg/l, two exceeded 8.0 mg/l.

Summary: In the South Branch of the Pennsauken, sanitary quality is poor and nutrient levels are very high. When compared to the previous assessment period (data collected from 1986 through 1990), there appear to have been reductions in levels of inorganic nitrogen and total phosphorus, and a notable decline in BOD. Sanitary quality, however, is the same as that observed in the last assessment.

In the North Branch, sanitary quality is fair. Nitrogen levels are acceptable while total phosphorus is elevated. BOD is elevated, although not to the degree observed in the South Branch. Spring and summer water temperatures may tend to be excessive. Water quality, as reflected in fecal coliform and nutrient levels, has notably improved here compared to the previous assessment (based upon data collected between 1986 through 1990).

Previous Inventory Reports have discussed high levels of chlordane and PCBs in fish that have been taken from the Pennsauken Creek mainstem and from the South Branch from Strawbridge Lake downstream. These levels were, and are still, regarded as posing a potential health hazard; as a result, recreational fishing continues to be banned in these waterways.

Biological Monitoring:

See the Biological Assessment Table located at the end of this section for details regarding macroinvertebrate assessments within the watershed. Macroinvertebrate community assessments indicated that the entire length of the South Branch of the Pennsauken Creek is severely impaired. The

North Branch is also severely impaired at its lower end near the confluence with the South Branch, and is moderately impaired along its remaining length.

Just north of the Pennsauken watershed are Pompeston Creek and Swedes Run. Pompeston is assessed to be moderately impaired; Swedes Run is moderately impaired in Moorestown and severely impaired in Delran.

POINT SOURCE ASSESSMENT

Currently no STPs discharge into the South Branch Pennsauken Creek. Several treatment plants in the North Branch Pennsauken are or have undergone upgrades. Both the Moorestown and Mapleshade plants have undergone upgrades, while the Woodstown STP upgrade is currently ongoing.

NONPOINT SOURCE ASSESSMENT

The North Branch of the Pennsauken is receiving pollution from several nonpoint sources. These include runoff from urban surfaces, roadways, bridge and highway construction sites, and leachate from landfills. These sources were assessed as being severe. Additional suspected sources include construction activities (declining), storm sewers, an industrial tract in Palmyra (oil runoff), septic systems, mining, and agricultural sources. Many of these sources are evaluated by the New Jersey Division of Fish, Game, and Wildlife as threatening the health of the fishery resources of the North Branch. Fish kills have occurred in Pennsauken Creek over the years.

Two lakes within the Pennsauken watershed have been reported as impaired by nonpoint sources. Strawbridge Lake receives urban runoff from a dense development of homes, offices, and light industry. This pollution is suspected as having contributed to fish and duck kills. A lake rehabilitation project for the lake, that includes draining and dredging, is nearing completion. The other lake, Memorial, also receives urban surface runoff which causes excess siltation.

DESIGNATED USE ASSESSMENT

Limited support of designated uses occurs in the Pennsauken watershed. Primary contact recreation is precluded in the waterways due to excess fecal coliform bacteria levels. The "aquatic life" use is either partially or not supported in the North Branch depending upon the location. The South Branch is considered to have a degraded fish community because of pollution sources and habitat destruction and a severely impaired macroinvertebrate community; hence, the river will not support the "aquatic life" designated use. Chlordane and PCB contamination of fish tissue has been detected in the past; hence, the South Branch Pennsauken along with the mainstem fail to support the “fish consumption use.”

RANCOCAS CREEK

WATERSHED DESCRIPTION

The Rancocas Creek watershed is 360 square miles and the largest in south-central New Jersey. Of this area, 167 square miles is drained by the North Branch and 144 square miles is drained by the South Branch. The North Branch is 31 miles long and is fed by the Greenwood Branch, McDonalds Branch, and Mount Misery Brook. The major tributaries to the South Branch include the Southwest Branch Rancocas Creek, Stop the Jade Run, Haynes Creek, and Friendship Creek. The mainstem flows about eight miles and drains an area of approximately 49 square miles before emptying into the Delaware River at Delanco and Riverside. Tidal influence occurs for about 15 stream miles, extending the entire length of the mainstream to the dam at Mt. Holly on the North Branch, Vincentown on the South Branch, and Kirby Mills on the Southwest Branch. Population centers are Pemberton Township, Medford Township, Medford Lakes Borough, Evesham Township, Mount Holly, and Willingboro. Major impoundments include Medford Lake, Pine Lake, Browns Mills Lake, and Crystal Lake.

About half of this drainage basin is forested, with the remaining area divided between agricultural use and urban/suburban. Significant development is taking place in many former agricultural areas. The eastern part of this watershed drains the Pinelands Protection Area. There are approximately 20 to 25 NJPDES permitted dischargers here, of which some 17 to 20 are municipal and the rest industrial/commercial. This watershed has been classified FW-Central Pine Barrens; FW-1 for the waters within the state parks, state forests, and wildlife management areas; and FW-2 Nontrout.

Note: As stated previously, the North Branch Rancocas Creek at Pemberton and the South Branch Rancocas Creek at Vincentown both lie at the border of the Pinelands Commission's special Protection Area, and hence will be assessed as both FW-2 Nontrout waters and as Pinelands (PL) waters.

WATER QUALITY ASSESSMENT

Physical/Chemical Water Quality

Locations: North Branch Rancocas Creek at Pemberton

Dissolved Oxygen: Acceptable.

Temperature: Acceptable.

Nutrients: When viewed as FW2-Nontrout waters, inorganic nitrogen and total phosphorous are both acceptable, with median values of 0.145 and 0.035 mg/l, respectively. From a Pinelands waters perspective, inorganic and organic nitrogen, and total phosphorous are all at levels characteristic of moderately disturbed Pinelands waters (Zampella, 1992).

North Branch Rancocas Creek at Pemberton continued:

Bacteria: Very mildly elevated bacterial levels were recorded at this location. The geometric mean was 22 MPN/100 ml and 10% of samples exceeded the 400/100ml criterion.

pH and Conductivity: The median pH and conductivity reflect moderately disturbed Pinelands waters (Zampella 1992).

Heavy Metals: Heavy metals violations were frequent in these acid waters. Three of five copper samples exceeded both the acute and chronic criteria. Of five lead samples, four exceeded both the chronic and acute criteria, while the fifth exceeded the chronic criterion. One violation of the acute and chronic criteria for zinc was recorded (out of five samples).

Locations: South Branch Rancocas Creek at Vincentown

Dissolved Oxygen: Daytime levels all lie within the FW2-NT criterion; however, warm weather levels are relatively low, suggesting stressful conditions at night.

Temperature: Although in-stream temperatures do not exceed the criterion for FW2-NT waters, they nonetheless tend to run warm in the summer at this location.

Nutrients: When viewed as FW2-Nontrout waters, inorganic nitrogen is acceptable and total phosphorous is mildly elevated, with median values of 0.55 and 0.11 mg/l, respectively. From a Pinelands waters perspective: inorganic and organic nitrogen, and total phosphorous are all at levels characteristic of disturbed Pinelands waters (Zampella, 1992).

Bacteria: Sanitary quality is very good at this location. The geometric mean was 61 MPN/100 ml and only 5% of samples exceeded the 400 MPN/100ml criterion.

pH and Conductivity: The median pH and conductivity reflect conditions observed in disturbed Pinelands waters (Zampella 1992).

Heavy Metals: The low hardness recorded in these acid waters renders the metals criteria very restrictive. As a result, one of four copper samples exceeded the chronic criterion for aquatic life support. Additionally, of four lead samples, all exceeded the chronic criterion, again for aquatic life support.

Location: McDonalds Branch in Lebanon State Forest

Dissolved Oxygen: Very depressed, more than half the samples below 4 mg/l.

Temperature: Acceptable.

Nutrients: The median inorganic nitrogen (NO_2 + NO_3), organic nitrogen, and total phosphorus are all characteristic of undisturbed Pinelands waters (Zampella 1992) and are consistent with levels observed between 1975 and 1986 (Zampella 1994).

McDonalds Branch continued:

pH and Conductivity: The median pH was characteristic of undisturbed conditions (Zampella 1992). Specific conductance was at the lower end of moderately disturbed conditions (Zampella 1992).

Bacteria: Fecal coliform levels were very low, with a geometric mean calculated to be less than 2 MPN/100ml.

Heavy Metals: This monitoring site is part of the USGS Hydrologic Bench-Mark network, a program for determining natural or background conditions, and as such does not sample for copper, lead, zinc and chromium.

Summary: When viewed as PL (Pinelands) waters, the North and South Branches of the Rancocas represent conditions reflective of moderately disturbed and disturbed Pinelands waters, respectively.

From the perspective of FW2-Nontrout waters, the North Branch represents good conditions with acceptable nutrient levels and relatively good sanitary quality. The problem here, as in other acid waters, lies in the severely restrictive heavy metals criteria calculated for these waters. As the result, the North branch appears to experience chronic exceedances of copper and lead, and occasional exceedances of zinc. Current nutrient and sanitary conditions are similar to those observed during the last assessment period using data collected between 1986 through 1990.

As FW2-Nontrout waters, the South Branch Rancocas represents fair conditions. Although inorganic nitrogen is acceptable, total phosphorous is mildly elevated, and sanitary quality is very good. Warm weather dissolved oxygen levels are suspected to be depressed at night, creating stressful conditions for aquatic life. As with the North Branch, this acid water experiences exceedances of copper and lead. As in the North Branch, present nutrient and sanitary conditions are similar to those observed during the last assessment period.

McDonalds Branch, a tributary of the North Branch Rancocas, is sampled in Lebanon State Forest in the heart of the Pinelands Area and represents unimpaired background physical and water quality characteristics indicative of the Pinelands Area. Dissolved oxygen saturation is low, due principally to the fact that groundwater is providing much of the base flow at this location, and that surface flow is often slack which in turn can slow aeration. The median pH, 4.2 SU, is typical of unimpacted Pinelands waters where nutrient inputs are very limited.

Biological Monitoring

See the Biological Assessment Table located at the end of this section for details regarding macroinvertebrate assessments within the watershed. The lower portions of the North Branch Rancocas are assessed as moderately impaired as are most of the tributaries to the North Branch. The upper portion of the North Branch itself as well as Mt. Misery Brook are

nonimpaired. A tributary to the mainstem, Mill Creek, was observed to be severely impaired. McDonalds Branch's assessment has alternated between moderately and severely impaired depending upon the date of the assessment.

Most monitoring locations in the South Branch Rancocas watershed are assessed as moderately impaired. There are, however, some locations that were assessed as either nonimpaired and severely impaired.

POINT SOURCE ASSESSMENT

The North and South Branches of Rancocas Creek suffer from low to moderate amounts of water pollution coming from both point and nonpoint sources. No facilities are reported to be under Department enforcement action as of the summer of 1996. In the tidal Rancocas Creek mainstem, a water quality modeling study had found excessive nutrients, elevated algae production, and highly fluctuating diurnal dissolved oxygen concentrations. The study also concluded that the principal sources of oxygen demand were more from sediment loading than from point source inputs.

NONPOINT SOURCE ASSESSMENT

Agricultural and suburban runoff is responsible for the pH, bacteria, and nutrient concentrations that are higher than natural background levels. It is expected that significant development pressures will further stress the streams in the Rancocas watershed. The Upper North Branch of the Rancocas receives nonpoint runoff from a wide assortment of sources; among these are dairy farms, croplands, road and housing construction, road salting, urban surfaces, and storm sewers. The fisheries in the lower reaches of the North Branch are evaluated as being threatened by runoff from housing construction, road maintenance, croplands, and the subsurface infiltration of septic wastes. The landfill in Pemberton has been described by local authorities as a threat to local water quality.

The fish population of Cranberry Branch, a tributary to the North Branch, is threatened by subsurface infiltration of septic wastes. In addition, this stream is believed to receive nonpoint source pollution from cropland runoff and from local housing construction. The upper South Branch Rancocas is suspected of suffering water quality degradation from sod farm runoff, road and housing construction, urban surface runoff, and septic tank leachate. Furthermore, a landfill in Lumberton is suspected of affecting water quality there.

The lower South Branch receives much of the same nonpoint source pollution as the upper reaches including runoff from housing construction, urban surfaces, croplands, septic systems, and surface mining activities. These are all believed to be associated with past fish kills which have occurred in this waterway.

Friendship Creek, Mason Creek and Mill Creek, all tributaries to the Rancocas, are suspected of being impacted by road and highway runoff. Friendship Creek is believed to be further impacted by a local sanitary landfill, while Mill Creek is suspected of being affected by urban runoff.

DESIGNATED USE ASSESSMENT

Bacterial monitoring indicates that the McDonalds Branch, the North Branch Rancocas at Pemberton, and the South Branch Rancocas at Vincentown all fully support primary contact (swimming) recreation.

Macroinvertebrate assessments indicate that the upper portions of the North Branch Rancocas fully support the "aquatic life support" designated use. The lower reach of the North Branch, along with some of the North Branch tributaries, only partially support the use. The South Branch also largely partially supports the use, however, significant portions do not support the use. Full support is limited within the South Branch watershed.

BIOLOGICAL ASSESSMENT TABLE: AREA 19

Mgt Area	Watershd	Site ID	Water Body	Location	Municipality	Sample Date	Biological Impairment Rating
19	56	AN0143	Rancocas Ck N Br	blw Hanover Lk	Hanover Furnace	Feb 23, 1993	non-impaired
19	56	AN0144	Polebridge Br	blw Country Lk	Pemberton Twp	Feb 23, 1993	moderately impaired
19	56	AN0145	Mt Misery Bk	Rt 70	Pemberton Twp	Feb 23, 1993	non-impaired
19	56	AN0146	McDonalds Br	USGS gage	Lebanon St For	Apr 17, 1991	moderately impaired
19	56	AN0146	McDonalds Br	USGS gage	Lebanon St For	Jun 11, 1991	severely impaired
19	56	AN0146	McDonalds Br	USGS gage	Lebanon St For	Sep 24, 1991	moderately impaired
19	56	AN0146	McDonalds Br	USGS gage	Lebanon St For	Dec 10, 1991	moderately impaired
19	56	AN0147	Bisphams Mill Ck	New Lisbon Rd	nr Lower Mill	Feb 23, 1993	moderately impaired
19	56	AN0148	Greenwood Br	New Lisbon Rd	New Lisbon	Feb 23, 1993	non-impaired
19	56	AN0149	Rancocas Ck N Br	Main St	Pemberton	Jan 26, 1993	non-impaired
19	56	AN0149	Rancocas Ck N Br	Main St	Pemberton	Jul 9, 1993	non-impaired
19	56	AN0149	Rancocas Ck N Br	Main St	Pemberton	Oct 18, 1993	non-impaired
19	56	AN0149	Rancocas Ck N Br	Main St	Pemberton	Apr 13, 1994	moderately impaired
19	56	AN0150	Budds Run	Main St	Pemberton	Feb 23, 1993	moderately impaired
19	56	AN0151	Rancocas Ck N Br	Pine St Pk	Mt Holly	Jan 26, 1993	moderately impaired
19	58	AN0152	Friendship Ck	Friendship Rd	Friendship	Mar 2, 1993	non-impaired
19	58	AN0153	Burrs Mill Bk	Hedgerhouse Rd	Woodland Twp	Mar 2, 1993	severely impaired
19	58	AN0153	Burrs Mill Bk	Hedgerhouse Rd	Woodland Twp	Mar 14, 1996	moderately impaired
19	58	AN0154	Burrs Mill Bk	Sooy Pl Rd	Pemberton Twp	Mar 2, 1993	non-impaired
19	58	AN0155	Friendship Ck	Retreat Rd	Retreat	Mar 2, 1993	moderately impaired
19	58	AN0156	Rancocas Ck S Br	Buddtown - Beaverville Rd	nr Retreat	Mar 2, 1993	severely impaired
19	58	AN0157	Jade Run	off Rt 206	nr Vincentown	Mar 2, 1993	moderately impaired
19	58	AN0158	Ltl Ck	Rt 70	Chairville	Mar 2, 1993	non-impaired
19	58	AN0159	Bear Swamp R	Rt 70	Chairville	Mar 2, 1993	moderately impaired
19	58	AN0160	Ltl Ck	Eayrestown Rd	Eayrestown	Mar 2, 1993	moderately impaired
19	58	AN0161	Rancocas Ck S Br	Mt Holly - Eayrestown Rd	Eayrestown	Apr 14, 1993	moderately impaired

BIOLOGICAL ASSESSMENT TABLE continued:

Mgt Area	Watershd	Site ID	Water Body	Location	Municipality	Sample Date	Biological Impairment Rating
19	58	AN0162	Rancocas Ck SW Br	Elmwood Rd	Evesham Twp	Apr 14, 1993	severely impaired
19	58	AN0163	Barton Run	Braddock Mill Rd & Rt 73	Kresson	Apr 14, 1993	moderately impaired
19	58	AN0164	Black Run	Kettle Run Rd	Evesham Twp	Apr 10, 1991	moderately impaired
19	58	AN0164	Black Run	Kettle Run Rd	Evesham Twp	Jun 11, 1991	non-impaired
19	58	AN0164	Black Run	Kettle Run Rd	Evesham Twp	Sep 24, 1991	non-impaired
19	58	AN0164	Black Run	Kettle Run Rd	Evesham Twp	Dec 10, 1991	non-impaired
19	58	AN0165	Black Run trib	Braddock Mill Rd	Evesham Twp	Apr 10, 1991	severely impaired
19	58	AN0165	Black Run trib	Braddock Mill Rd	Evesham Twp	Jun 11, 1991	severely impaired
19	58	AN0165	Black Run trib	Braddock Mill Rd	Evesham Twp	Sep 24, 1991	moderately impaired
19	58	AN0165	Black Run trib	Braddock Mill Rd	Evesham Twp	Dec 10, 1991	moderately impaired
19	58	AN0166	Barton Run	Tuckerton Rd	Hoot Owl Estates	Apr 14, 1993	severely impaired
19	58	AN0167	Kettle Run	Hopewell Rd	Evesham Twp	Apr 14, 1993	moderately impaired
19	58	AN0168	Haynes Ck	Himmelein Rd	Oliphant Mills	Apr 14, 1993	non-impaired
19	58	AN0169	Rancocas Ck SW Br	Rt 70	Medford	Apr 14, 1993	moderately impaired
19	58	AN0170	Sharps Run	Rt 541	Medford	Apr 14, 1993	moderately impaired
19	58	AN0171	Bobbys Run	Newbolds Cor Rd	Lumberton	Apr 14, 1993	moderately impaired
19	58	AN0172	Masons Ck	Ark Rd	Lumberton	Apr 10, 1991	moderately impaired
19	58	AN0172	Masons Ck	Ark Rd	Lumberton	Jun 11, 1991	severely impaired
19	58	AN0172	Masons Ck	Ark Rd	Lumberton	Sep 24, 1991	moderately impaired
19	58	AN0172	Masons Ck	Ark Rd	Lumberton	Dec 10, 1991	severely impaired
19	58	AN0173	Masons Ck	Rt 38	Union Mills	Apr 14, 1993	moderately impaired
19	54	AN0174	Parkers Ck	Creek Rd	Centerton	Apr 14, 1993	moderately impaired
19	54	AN174A	Parkers Ck	Rt 603	Mt Laurel	Apr 10, 1991	severely impaired
19	54	AN0175	Mill Ck	Levitt Pkwy	Willingboro	Jan 26, 1993	severely impaired
19	55	AN0176	Swedes Run	Rt 130	Delran	Apr 15, 1993	severely impaired
19	55	AN176A	Swedes Run	Garwood Rd	Moorestown	Oct 4, 1990	moderately impaired

BIOLOGICAL ASSESSMENT TABLE continued:

Mgt Area	Watershd	Site ID	Water Body	Location	Municipality	Sample Date	Biological Impairment Rating
19	55	AN0177	Pompeston Ck	Rt 130	Cinnaminson	Apr 15, 1993	moderately impaired
19	55	AN177A	Pompeston Ck	New Albany Rd	Moorestown	Nov 14, 1990	moderately impaired
19	57	AN0178	Pennsauken Ck N Br	Church Rd	Mt Laurel	Oct 4, 1990	moderately impaired
19	57	AN0178	Pennsauken Ck N Br	Church Rd	Mt Laurel	Mar 18, 1992	moderately impaired
19	57	AN0179	Pennsauken Ck N Br	Fellowship Rd	Mt Laurel	Mar 18, 1992	moderately impaired
19	57	AN0180	Pennsauken Ck N Br	Rt 537	Maple Shade	Mar 18, 1992	moderately impaired
19	57	AN0181	Pennsauken Ck N Br	Fork Landing Rd	Maple Shade	Mar 18, 1992	severely impaired
19	57	AN0182	Pennsauken Ck S Br	Greentree Rd	Cherry Hill	Mar 18, 1992	severely impaired
19	57	AN0183	Pennsauken Ck S Br	Rt 41	Maple Shade	Mar 18, 1992	severely impaired
19	57	AN0184	Pennsauken Ck S Br	Rt 537	Maple Shade	Mar 18, 1992	severely impaired
19	57	AN0185	Pennsauken Ck S Br	Fork Landing Rd	E Pennsauken	Mar 18, 1992	severely impaired
19	60	AN0186	Cooper R N Br	Kresson Rd	Kresson	Apr 15, 1993	severely impaired
19	60	AN0187	Cooper R N Br	Springdale Rd	Cherry Hill Twp	Apr 15, 1993	severely impaired
19	60	AN0188	Cooper R N Br	River Dr	Erlton	Apr 15, 1993	severely impaired
19	60	AN0189	Cooper R S Br	Gibbsboro Rd	Gibbsboro	Apr 15, 1993	severely impaired
19	60	AN0190	Cooper R S Br	Evesham Rd	Magnolia	Apr 15, 1993	severely impaired
19	60	AN0191	Cooper R S Br	Rt 41	Haddonfield	May 15, 1991	severely impaired
19	60	AN0191	Cooper R S Br	Rt 41	Haddonfield	Apr 15, 1993	severely impaired
19	61	AN0653	Newton Ck	Rt 168	W Collingswood	Jul 11, 1995	severely impaired
19	61	AN0654	Newton Ck S Br	Rt 168	Mt Ephraim	Jul 11, 1995	severely impaired